

AMENDMENTS TO THE CLAIMS

1. (Original) A method, comprising:
applying a flux to a first surface of a substrate, the first surface of the substrate
having attached thereto solder bumps, the solder bumps having a melting
temperature, and the flux substantially comprising ingredients that have a
volatilization temperature less than the melting temperature;
generally aligning the solder bumps with corresponding metal bumps, the metal
bumps being attached to a first surface of a chip;
bringing the solder bumps into contact with the corresponding metal bumps; and
heating the solder bumps to a first temperature, the first temperature being
equal to or greater than the melting temperature.
2. (Original) The method of claim 1, wherein the first surface of the chip comprises
copper.
3. (Original) The method of claim 1, wherein the bringing of the solder bumps into
contact with the corresponding metal bumps, further includes applying a contact
force.
4. (Original) The method of claim 3, wherein the contact force is removed just after
the solder bumps have been heated to at least the melting temperature.
5. (Original) The method of claim 1, wherein the solder bumps are comprised of a
96.5% tin, 3.5% silver solder.

6. (Original) The method of claim 1, wherein the flux includes a carboxylic acid and has a volatilization temperature of approximately 200 degrees Celsius.
7. (Original) The method of claim 1, further comprising:
joining the solder bumps to the metal bumps by cooling the solder bumps to a
temperature below the melting temperature;
heating the first surfaces of the chip and substrate to within a temperature range,
the temperature range being equal to or greater than the volatilization
temperature but less than or equal to the melting temperature; and
maintaining the chip and substrate first surfaces within the temperature range for a
first period of time.
8. (Original) The method of claim 1, wherein the heating of the solder bumps
comprises heating the solder bumps through a second surface of the chip, the
second surface of the chip being opposite the first surface of the chip.
9. (Original) The method of claim 8, wherein the heating of the solder bumps to a
first temperature further includes rapidly increasing the temperature of the second
surface to a second temperature, the second temperature being greater than the
first temperature, wherein a temperature gradient is established through the chip
from the second surface at the second temperature to the first surface of the chip
at the first temperature.
10. (Original) The method of claim 8, wherein the heating of the solder bumps to the
first temperature comprises providing a heater in contact with the second surface.

11. (Original) The method of claim 9, wherein a third temperature at a second substrate surface opposite the first substrate surface is significantly below the first temperature, when the first surface of the chip is at the first temperature.
12. (Original) The method of claim 9, further comprises maintaining the second surface at the second temperature for a period of time.
13. (Original) The method of claim 12, wherein the period of time is approximately 1 to 5 seconds.

Claims 14-39 (Canceled)